What is claimed is:

1. A CCD color solid-state image pickup device comprising:

a plurality of light-receiving sections arranged in an array on the surface of a semiconductor substrate; and

a vertical transfer path by way of which signal electric charges stored in electric charge storage sections of the respective light-receiving sections are read and transferred to a horizontal transfer path,

wherein the electric charge storage section of each of the light-receiving sections has a plurality of electric charge storage layers which are provided in a depthwise direction of the semiconductor substrate with potential barriers interposed therebetween; and signal electric charges stored in the respective electric charge storage layers are read independently to the vertical transfer path.

2. The CCD color solid-state image pickup device according to claim 1, wherein an electric charge path, which causes electric charges stored in the electric charge storage layers to migrate to the surface of the semiconductor substrate and is formed from a heavily-doped impurity region, is provided in an electric charge storage layer from among the plurality of electric charge storage layers, the electric charge storage layer being provided in the semiconductor substrate.

3. The CCD color solid-state image pickup device according to claim 1, wherein a concentration gradient is imparted such that the dopant concentration of the electric charge storage layers formed as heavily-doped impurity regions and the dopant concentration of the electric charge path continually connected to the electric charge storage layer increase as the electric charge storage layer and the electric charge path approach the vertical transfer path.

4. The CCD color solid-state image pickup device according to claim 1, wherein the depths of the respective electric charge storage layers are set in accordance with wavelengths of incident light to be detected.

5. The CCD color solid-state image pickup device according to claim 1,

wherein three electric charge storage layers are provided as the plurality of electric charge storage layers;

an electric charge storage layer provided at the deepest location from among the three electric charge storage layers stores signal electric charges corresponding to red (R) incident light;

an electric charge storage disposed in a surface section stores signal electric charges corresponding to blue (B)

incident light; and

an electric charge storage layer provided at an intermediate section stores signal electric charges corresponding to green (G) incident light.

6. The CCD color solid-state image pickup device according to claim 5, wherein the depth of the electric charge storage layer provided in the surface section ranges from 0.2 to 0.4 μm; the depth of the electric charge storage layer provided in the intermediate section ranges from 0.4 to 0.8 μm; and the depth of the electric charge storage layer provided in the deepest section ranges from 0.8 to 2.5 μm.

7. The CCD color solid-state image pickup device according to claim 1,

wherein a first light-receiving section for storing blue (B) and green (G) signal electric charges and a second light-receiving section for storing signal green (G) and red (R) signal electric charges are alternately provided as the light-receiving sections on the surface of the semiconductor substrate;

the first light-receiving section is provided with a first electric charge storage layer for storing blue (B) signal electric charges and a second electric charge storage layer for storing green (G) signal electric charges; and

the second light-receiving section is provided with a second electric charge storage layer for storing green (G) signal electric charges and a third electric charge storage layer for storing red (R) signal electric charges.

8. The CCD color solid-state image pickup device according to claim 7, wherein the depth of the first electric charge storage layer ranges from 0.2 to 0.4 μm; the depth of the second electric charge storage layer ranges from 0.4 to 0.8 μm; and the depth of the third electric charge storage layer ranges from 0.8 to 2.5 μm.

9. The CCD color solid-state image pickup device according to claim 1, wherein on-chip light gathering optical systems are provided on upper portions of the respective light-receiving sections, and one opening of each light-shielding film corresponds to one of the light-receiving sections.

10. The CCD color solid-state image pickup device according to claim 1,

wherein the light-receiving section is provided with a first electric storage layer for storing blue (B) signal electric charges and a second electric charge storage layer for storing green (G) signal electric charges; and

electric charges stored in the vertical transfer path are used as signal electric charges corresponding to red (R) incident light.

11. The CCD color solid-state image pickup device according to claim 10, wherein the depth of the first electric charge storage layer ranges from 0.2 to 0.4 μm; and the depth of the second electric charge storage layer ranges from 0.4 to 0.8 μm.

12. The CCD color solid-state image pickup device according to claim 1, wherein the light-receiving sections are arranged in a square grid pattern on the surface of the semiconductor substrate.

13. The CCD color solid-state image pickup device according to claim 1, wherein the light-receiving sections are arranged in a honeycomb pattern on the surface of the semiconductor substrate.

14. The CCD color solid-state image pickup device according to claim 2,

wherein three electric charge storage layers are provided as the plurality of electric charge storage layers;

an electric charge storage layer provided at the deepest

location from among the three electric charge storage layers stores signal electric charges corresponding to red (R) incident light;

an electric charge storage disposed in a surface section stores signal electric charges corresponding to blue (B) incident light; and

an electric charge storage layer provided at an intermediate section stores signal electric charges corresponding to green (G) incident light.

15. The CCD color solid-state image pickup device according to claim 2,

wherein a first light-receiving section for storing blue (B) and green (G) signal electric charges and a second light-receiving section for storing signal green (G) and red (R) signal electric charges are alternately provided as the light-receiving sections on the surface of the semiconductor substrate;

the first light-receiving section is provided with a first electric charge storage layer for storing blue (B) signal electric charges and a second electric charge storage layer for storing green (G) signal electric charges; and

the second light-receiving section is provided with a second electric charge storage layer for storing green (G) signal electric charges and a third electric charge storage layer for

storing red (R) signal electric charges.

16. The CCD color solid-state image pickup device according to claim 2,

wherein the light-receiving section is provided with a first electric storage layer for storing blue (B) signal electric charges and a second electric charge storage layer for storing green (G) signal electric charges; and

electric charges stored in the vertical transfer path are used as signal electric charges corresponding to red (R) incident light.

17. The CCD color solid-state image pickup device according to claim 3,

wherein three electric charge storage layers are provided as the plurality of electric charge storage layers;

an electric charge storage layer provided at the deepest location from among the three electric charge storage layers stores signal electric charges corresponding to red (R) incident light;

an electric charge storage disposed in a surface section stores signal electric charges corresponding to blue (B) incident light; and

an electric charge storage layer provided at an intermediate section stores signal electric charges

corresponding to green (G) incident light.

18. The CCD color solid-state image pickup device according to claim 3,

wherein a first light-receiving section for storing blue (B) and green (G) signal electric charges and a second light-receiving section for storing signal green (G) and red (R) signal electric charges are alternately provided as the light-receiving sections on the surface of the semiconductor substrate;

the first light-receiving section is provided with a first electric charge storage layer for storing blue (B) signal electric charges and a second electric charge storage layer for storing green (G) signal electric charges; and

the second light-receiving section is provided with a second electric charge storage layer for storing green (G) signal electric charges and a third electric charge storage layer for storing red (R) signal electric charges.

19. The CCD color solid-state image pickup device according to claim 3,

wherein the light-receiving section is provided with a first electric storage layer for storing blue (B) signal electric charges and a second electric charge storage layer for storing green (G) signal electric charges; and

electric charges stored in the vertical transfer path are used as signal electric charges corresponding to red (R) incident light.